Population Health Matters

Vol. 27 No. 2 | **SPRING 2014**

Data Analytics in Population Health

Population Health Management relies on data – to identify the populations and the needs for care, to measure the care provided to these populations, and to help deliver the right care to the right people. Population Health Management (PHM) systems are the hottest item in health IT at the moment – there are high expectations, articles, conferences, papers, webinars. You probably get many emails about PHM systems. The market is frothy, typical for the early stage of a new trend: a new set of products, new vendors entering the market, and customers wondering when the time is right to enter this new market. This article reviews elements of PHM systems, and key trends in terms of companies entering this space.

The explosion of new offerings is caused by two intersecting trends, resulting in a perfect opportunity. The first trend is the availability of data: stimulated by the government's (HITECH) Meaningful Use[1] program, many hospitals and physician practices have moved from paper medical records to electronic medical records (EMRs). As a result, data have become "liquid" – electronic, usable for reporting, for querying, for exchange between healthcare providers, and for analysis. Charge data and billing data has always been electronic and available for analysis – but clinical data is just recently becoming available electronically on a wide scale: problem lists, home medications, procedures, lab results, and the results of physical exams and doctor's office visits. Having the data electronically doesn't necessarily mean it's easy to use for analysis, but at least it's accessible, unlike data in paper records.

The second of these intersecting trends is the emergence of new payment approaches, through the Patient Protection and Affordable Care Act (PPACA), encouraging a shift toward population-based care, accountable care, and risk-sharing.[2] These are mechanisms to shift some risk from the payer to the provider, and thus to incentivize providers to focus more on preventive care, on managing chronic conditions better, while preventing expensive acute episodes. To do this, they need detailed, accurate, and timely data on their patients, and their populations (Figure 1).

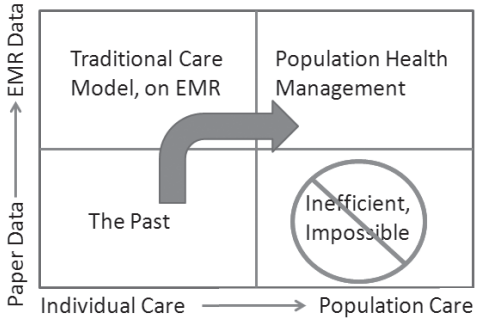
With more electronic data available for analysis, and a growing need for data to support population-based care, the market is ready for a new generation of "Population Health Management Systems."

Population Health Management Systems have three tasks:

1. Gathering data from multiple sources, and transforming this data into a usable format.
2. Applying analytics to the data – metrics, reports, trends, graphs, work lists.
3. Managing the care for the population – work lists for care managers, alerts and reminders for providers, postcards to patients, reminders to patients on their electronic patient portals.

The first step, gathering data, is the most difficult. Even though the data is now more electronically available than before, there are still many data challenges. Healthcare in the US is mostly provided by separate, independent providers: physician offices, hospitals, laboratory companies. Each participant has their own set of data on their patients – but often no one has the complete data. To lay the foundation for data-driven population health management, data needs to be integrated from multiple organizations: payers (claims), physician practices and hospitals (medical records). Data coming from multiple independent organizations needs to undergo transformations: formatting the data into a uniform structure, matching up terms and codes, and mapping patient and provider identifiers.

Figure 1. EMR as a Stepping Stone to Population Health



Data gathering and transformation lays the foundation for all subsequent steps, and it's important to get it right.

With a data foundation in place, Population Health Management systems apply analytics and reports to:

- *Define one or more populations*: patients with a chronic disease, patients under the care of a particular set of providers, or any other grouping.
- *Stratify Risk*: within each population, which patients (or members) are at high risk, and need to be the focus for better care management. Risk stratification is not just a financial exercise to identify which members cost the most or have the highest utilization – it's a clinical exercise to help understand which members have a chronic disease and are in need of better care management.
- *Generate Measures, Trends, Graphs, Work lists*: by applying standard quality metrics (for example, from the National Quality Forum[3]) – or by building organization-specific measures, the Population Health Management system creates reports, trends, charts and work lists.

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Some Population Health Management systems also include a Care Management component: software that generates work lists for patients who should be contacted for an intervention (such as a phone call, education session or a home visit), and tools to document the care provided to the patients.

As in any new market, there are many companies entering the Population Health Management space. We can distinguish three types of companies now active in this field.[4] First, traditional Data Warehousing companies (Oracle, IBM, SAP) provide the databases required for large data management, and the ETL (Extract Transform and Load) tools to take data from multiple sources and bring it together into a large coherent base for analysis. These companies provide strong and sophisticated data management and analysis tools. However, the tools are generic, and usually do not include tools and components specific to Population Health Management.

The second type of companies are new, emerging firms that provide specific tools for Population Health Management, in each of the three areas listed above. Examples include: Advisory Board / Evolent, Covisint, i2i Systems, Phytel, and others. These companies create software specific to PHM – from the data gathering with healthcare-specific data models, to the care management work lists.

Third, many of the traditional EMR companies (Epic, Cerner, eClinicalWorks, NextGen) are now entering the PHM field. While they lag somewhat behind the PHM-specific companies, the EMR companies have an advantage in that they are close to the data, and close to the users. Rather than building a separate infrastructure to manage population health, organizations would likely prefer to use their existing EMR systems to also take on PHM work. The question is whether these firms will be able to also manage the external data from practices, payers and other participants outside the health system.

Population Health Management is a new field, and the rules of the game are still changing. This is an industry in flux, a work in progress. At this stage in the development of PHM, it's not likely that one company will do everything and do it well. Organizations should plan on using more than one system to cover the variety of tasks -- for example, one system for data aggregation and risk stratification, and a different system for care management. They should plan to adjust as the rules develop and mature.

Most importantly, organizations should start by building a data foundation that is solid and comprehensive. If the underlying database is incomplete, or inconsistent, it will be impossible to deliver valid analytics and drive the care for a population.

There are many uncertainties in the new field of Population Health Management. The shift from individual care to population care will continue, and the PHM technology will continue to evolve and improve. Despite this state of flux, one thing will be certain – PHM is all about the data, from inside and outside the organization. This is the time to lay the data foundation and to start investing in PHM systems. ■

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